Journal of Adolescent Health 79 (2026) 242–249

ELSEVIER

JOURNAL OF ADOLESCENT HEALTH

www.jahonline.org

Original article

Stability of Transgender Identity in Adolescents Seen in Multidisciplinary Specialized Gender Centers: A Multicenter Study in Canada

Daniel L. Metzger, M.D. [a], Arati Mokashi, M.D. [b], Danièle Pacaud, M.D. [c], Nicole Thompson, M.D. [c,d], Reza Belaghi, Ph.D. [e], Anne Tsampalieros, Ph.D. [e], and Margaret L. Lawson, M.D., M.Sc. [e,f,*]

[a] *Endocrinology Division, BC Children's Hospital, University of British Columbia, Vancouver, British Columbia, Canada*
[b] *Division of Endocrinology, Department of Pediatrics, Dalhousie University, IWK Health Centre, Halifax, Nova Scotia, Canada*
[c] *Department of Pediatrics, Alberta Children's Hospital, Cumming School of Medicine, University of Calgary, Calgary, Alberta, Canada*
[d] *Gynecology Division, Vancouver Coastal Health, Vancouver General Hospital, Vancouver, BC, Canada*
[e] *CHEO Research Institute, Ottawa, Ontario, Canada*
[f] *Faculty of Medicine, Pediatrics Department, University of Ottawa, Ottawa, Ontario, Canada*

Article history: Received August 25, 2025; Accepted March 30, 2026
Keywords: Transgender; Nonbinary; Gender identity; Gender dysphoria; Detransition; Hormones; Adolescent; Endocrinology

A B S T R A C T

Purpose: To determine the proportions of adolescents continuing with their gender identity after referral to specialized gender clinics, the proportion continuing with gender-affirming hormones, and the proportion who detransition.
Methods: A retrospective chart review was conducted for adolescents referred with gender dysphoria to four Canadian pediatric endocrinology gender clinics between 2012 and 2017.
Results: For the 445 adolescents, median gender clinic follow-up was 2.4 years (interquartile range: 1.1–7.2); 331 (74.4%) were assigned female sex at birth (AFAB) and 114 (25.6%) assigned male (AMAB). Mean (standard deviation) age of reported gender dysphoria onset was 9.5 (3.6) years. In total, 421 (94.6%) continued with their presenting gender identity or reidentified as non-binary, while 24 (5.4%) changed back to gender identity typically aligned with their birth sex. Among 317 AFAB identifying as male at referral, 15 (4.7%) changed gender identity: 10 to female and five to non-binary. Of the 109 AMAB youth identifying as female at referral, five (4.6%) changed gender identity: three to male and two to non-binary. Among the 19 adolescents identifying as non-binary at referral, four (21.0%) changed gender identity: three AMAB to female and one AFAB to male. Gender-affirming hormones were started by 353 (79.3%) and discontinued by only four (1.1%) of adolescents.
Discussion: The majority (97.1%) of adolescents continued to identify with a gender not typically aligned with their birth sex. Only 2.9% reverted to a gender identity aligned with their birth sex. None who initially identified as non-binary returned to binary gender aligned with birth sex. Discontinuation of gender-affirming hormones was rare.
© 2026 Society for Adolescent Health and Medicine. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

IMPLICATIONS AND CONTRIBUTION

The increase in adolescents identifying as transgender has raised concerns that these adolescents may detransition more frequently than those presenting as adults. This retrospective study found that it was uncommon for adolescents to resume gender identity associated with assigned sex at birth and rare for adolescents to discontinue gender-affirming hormones (GAHs).

Conflicts of interest: The authors have no conflicts of interest to declare.

* Address correspondence to: Margaret L. Lawson, M.D., M.Sc., CHEO Research Institute, 401 Smyth Road, Ottawa, Ontario K1H 8L1, Canada.
E-mail address: lawsonresearch@cheo.on.ca (M.L. Lawson).

1054-139X/© 2026 Society for Adolescent Health and Medicine. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
https://doi.org/10.1016/j.jadohealth.2026.03.016

The number of adolescents and children identifying as transgender or non-binary (TNB) and seeking gender-affirming care almost tripled in the United States and Canada between 2017 and 2021 [1,2]. Gender transition and gender-affirming medical care may comprise different pathways, including change in gender expression; social transition, such as clothing, haircut, new name, and/or pronouns; gonadotropin suppression therapy (GST) or adjunctive therapy (AT); GAH; and gender-affirming surgery.

The World Professional Association for Transgender Health (WPATH) Standards of Care version 8 (SOC 8) and Endocrine Society Clinical Practice Guidelines and German Guidelines lay out the evidence and consensus for provision of gender-affirming care to youth [3–5]. A prospective study of 315 TNB adolescents in the USA found that there was congruence with their appearance and improved psychosocial functioning 2 years after starting GAH [6]. A study of 11,914 TNB youth who completed an online survey found that those who received GAH were less likely to report recent depression or have seriously considered, or attempted suicide in the last year [7]. In recent years, concerns have been raised that adolescents who identified with a gender different from that typically aligned with sex assigned at birth later discontinued or reversed gender-affirming medical or surgical interventions, the process known as detransition [1,8]. Some reports suggest that this equates with regret [9–11], there was inadequate assessment prior to gender transition, or gender transition was too accessible for adolescents [9–11]. In contrast, more recent studies found reidentification rates of 5.3% in 548 adolescents and 2.9% in 1,089 adolescents, and both studies found low rates of discontinuation of GAHs [12,13]. Boskey et al. reported that 0.5% of 1,050 adolescents discontinued GAH because they reidentified with gender assigned at birth, although 210 had not been heard from for more than 12 months [14]. Despite there being broad consensus among major medical organizations about the necessity of gender-affirming care [3–5], some government bodies continue to raise questions about access to gender-affirming care [15–18].

Gender dysphoria (GD) is defined as marked incongruence between one's experienced or expressed gender and sex assigned at birth for at least 6 months' duration [19]. GD is associated with higher anxiety and depression [20–22], more self-harm, and more suicidal ideation than in cisgender adolescents [21,22]. The Endocrine Society Clinical Practice Guidelines specify consideration of GST or AT (such as spironolactone or continuous oral contraceptives) in adolescents with persistent GD once they have started puberty, and that there may be compelling reasons to start GAH prior to age of 16 years while recognizing the dearth of research supporting outcomes of early medical treatment [4]. WPATH SOC 8 focuses on the persistence of gender incongruence and adolescents' demonstration of emotional and cognitive maturity, ideally with informed consent for GST or AT and/or GAH from at least one legal guardian [3].

The objectives of this study were to determine among a cohort of adolescents diagnosed with GD and referred between 2012 and 2017 to pediatric endocrinologists at four gender clinics in Canada: (1) the proportion continuing with transgender/non-binary identity after referral; (2) the proportion continuing with GST, AT, and/or GAH; (3) the reasons reported by the adolescents for GST, AT, and/or GAH discontinuation; and (4) the proportion of adolescents who reidentified with a gender consistent with their birth sex.

Methods

We conducted a retrospective chart review of adolescents diagnosed with GD, and seen between 2012 and 2017, by pediatric endocrinologists prescribing GST, AT, and GAH, in Canadian youth gender clinics. In 2021, Canada had 10 tertiary care hospital-based clinics providing gender-affirming medical care to TNB adolescents [23]; four of these clinics participated in this study. For the purposes of this paper, the term "adolescent" is used as in the WPATH SOC 8 [3] to mean a youth who has started puberty. Each of the four study clinics followed the Endocrine Society [4] and WPATH SOC 7 [24] guidelines and completed a comprehensive biopsychosocial assessment by a trans-competent psychiatrist, psychologist, registered social worker, or adolescent medicine specialist, providing written documentation of a diagnosis of GD using the DSM-5 criteria [19]; decision-making capacity; coexisting mental health conditions and any co-morbidities; and evaluated hormone readiness. These clinicians also provided support and resources to the family prior to referral to the pediatric endocrinologist in the gender clinics. These assessments included parent(s)/guardian(s). Readiness for GST, AT, and/or GAH therapy required long-lasting GD that persisted or worsened with puberty. Adolescents were assessed for capacity to provide informed consent for GST, AT, and/or GAH. For minors or those without capacity, parent(s)/guardian(s) could provide consent. If comorbid psychological, medical, or social conditions were identified, these were concurrently addressed. All GST, AT, and GAH prescriptions were written by a pediatric endocrinologist, after confirming puberty (at least Tanner stage 2 or higher) and medical readiness [4]. Impact on fertility was routinely discussed, and when available, fertility preservation consultation was offered prior to initiation of GST, AT, and/or GAH. GST in our study included depot and aqueous leuprolide acetate, depot triptorelin pamoate, and depot medroxyprogesterone acetate, while AT included spironolactone and continuous oral contraceptive pills. Inclusion criteria for this study are as follows: (1) prescriptions for GST, AT, and/or GAH considered once the adolescent had begun puberty; (2) adolescent had at least 1 year of follow-up after first gender clinic visit; and (3) informed consent of adolescent and/or parent(s)/guardian(s) obtained before initiation of GST, AT, and/or GAH [4]. The research protocol was approved by the Research Ethics Boards at Children's Hospital of Eastern Ontario; University of Calgary and Alberta Health Services; BC Children's Hospital and the University of British Columbia; and IWK Health, Halifax.

Data were extracted from electronic and/or paper medical records between 2018 and 2020 (for the study period, 2012–2017), including: age at which adolescents reported that they had first experienced symptoms of GD, age at which youth were referred to the gender clinic, age at first gender clinic visit and at subsequent visits over the follow-up period. Age at first GD experience was based on clinical history, provided by the youth and their parent(s)/guardian(s). This was also extracted from the GST, AT, or GAH written assessments completed by trans-competent mental health providers. No surveys or questionnaires were used. Data were used to determine: (1) number of referrals of youth either assigned female sex at birth (AFAB) or

assigned male sex at birth (AMAB) each year and age at referrals for each group; (2) time duration between adolescents' first report identifying with gender not typically aligned with sex assigned at birth, their referral to gender clinic, and their first visit to that clinic; (3) number of adolescents who changed their gender identity from that reported at their first gender clinic visit; (4) number of youth who had started GST, AT, and/or GAH and age/grade when they started; and (5) number of youth who stopped GST, AT, and/or GAH and reasons reported for GST, AT, or GAH discontinuation. Puberty was confirmed by physical examination or blood testing.

All ages were created by combining year and months. For participants who provided school grade in place of age at recognition of GD, we imputed an age based on the following reference [25], using mid-point of age range provided. For example, grade 1 is 6–7 years, and we imputed age of 6.5 years (Supplemental Table). Calendar year at referral was calculated by taking difference between age at first visit and age at chart review and subtracting from calendar year of chart review. Duration of follow-up was taken as difference between age at chart review and age at first visit. Difference between start of GST or AT and start of GAH was taken as difference in reported age of starting GST or AT and age starting GAH.

Statistical analysis

Descriptive analysis of data was performed using mean and standard deviation (SD) and/or median and interquartile ranges (IQRs) and proportions with frequencies. Wilson score was used to calculate 95% confidence intervals (95% CIs) for the percentages [26]. Comparisons of continuous variables between sex assigned at birth were tested using the Wilcoxon rank sum test and Pearson's chi-squared test for categorical variables. In order to compare distribution of continuous variables by the calendar year, Kruskal–Wallis test was used. A p value of <0.05 was considered a significant difference. All statistical analyses were completed using R software (version 4.4.1) [27].

Results

Between 2012 and 2017, 445 adolescents diagnosed with GD were referred for GST, AT, and/or GAH to pediatric endocrinologists at four pediatric gender clinics: Children's Hospital of Eastern Ontario Diversity Clinic (n = 149), IWK Trans Health Clinic (n = 109), BC Children's Hospital Gender Clinic (n = 95), and Alberta Children's Hospital Metta Clinic (n = 92). The mean (SD) age at first visit was 15.3 (2.1) years, with 82.9% of youth between ages of 13 and 18 years. Table 1 shows characteristics by sex assigned at birth; 74.4% (n = 331) were AFAB, and 25.6% (n = 114) were AMAB. None of the 445 adolescents were lost to follow-up.

Age at first clinic visit was reported for all participants. Age when GD realized was based on numerical value for 309 and was imputed from reported grade in 120 participants (see Supplemental Table); neither age nor grade were documented for 16 participants, as these participants had not reported this information to the pediatric endocrinologist in the gender clinic. The mean (SD) age at which adolescents first noticed a difference between sex assigned at birth and gender identity was 9.5 (3.6) years (range 2.0–17). Mean (SD) age of GD imputed from

Table 1
Characteristics by sex at birth

Characteristics	Overall N = 445[a]	Male N = 114[a]	Female N = 331[a]	p value[b]
Gender identity at first visit				<.001
Male	317 (71%)	0 (0%)	317 (96%)	
Female	109 (24%)	109 (96%)	0 (0%)	
Non-binary	19 (4.3%)	5 (4.4%)	14 (4.2%)	
Age of gender dysphoria onset				
Median (Q1, Q3)	10.0 (6.5, 12.5)	10.0 (6.0, 12.8)	10.2 (7.0, 12.5)	.8
Mean (SD)	9.5 (3.6)	9.3 (3.8)	9.5 (3.6)	
(Missing)	16	2	14	
Age youth referred for hormone treatment				
Median (Q1, Q3)	15.2 (14.0, 16.3)	15.0 (14.0, 16.1)	15.3 (14.0, 16.3)	.2
Mean (SD)	14.9 (2.1)	14.7 (2.4)	15.0 (1.9)	
(Missing)	29	6	23	
Age at first visit				
Median (Q1, Q3)	15.6 (14.3, 16.7)	15.4 (14.3, 16.3)	15.7 (14.3, 16.7)	.14
Mean (SD)	15.3 (2.1)	15.0 (2.4)	15.4 (2.0)	
Time between referral and first visit				
Median (Q1, Q3)	0.3 (0.2, 0.4)	0.3 (0.2, 0.4)	0.3 (0.2, 0.4)	.9
Mean (SD)	0.4 (0.3)	0.3 (0.3)	0.4 (0.3)	
(Missing)	29	6	23	
Received gonadotropin suppression therapy and/or adjunctive therapy	299 (67%)	93 (82%)	206 (62%)	<.001
Age started gonadotropin suppression therapy and/or adjunctive therapy				
Median (Q1, Q3)	15.3 (14.2, 16.3)	15.3 (14.3, 16.3)	15.3 (13.9, 16.3)	0.5
Mean (SD)	15.0 (1.8)	15.2 (1.7)	14.9 (1.8)	
(Missing)	4	2	2	
Received gender-affirming hormones	353 (79%)	84 (74%)	269 (81%)	0.085
Age started gender-affirming hormones				
Median (Q1, Q3)	16.3 (15.4, 17.3)	16.3 (15.6, 17.1)	16.3 (15.3, 17.3)	.8
Mean (SD)	16.3 (1.3)	16.4 (1.5)	16.3 (1.3)	
(Missing)	4	1	3	

[a] n (%).
[b] Fisher's exact test; Wilcoxon rank sum test; Pearson's chi-squared test.

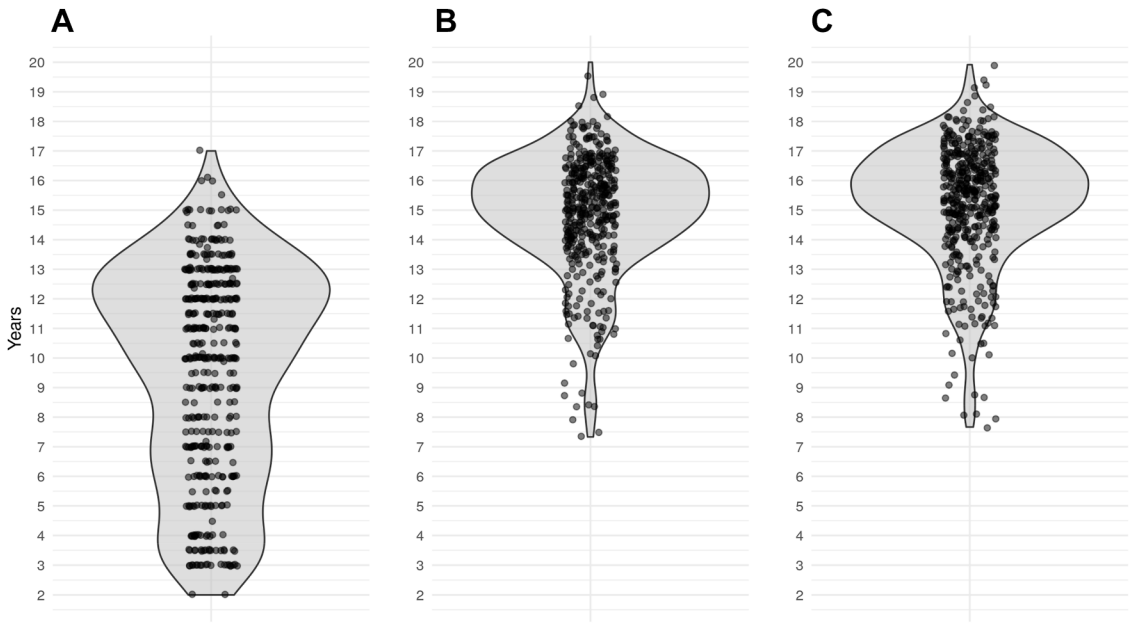

Figure 1. Distribution of age at onset of gender dysphoria (A), referral to pediatric endocrinologist (B), and first pediatric endocrinology visit (C).

school grade alone was 9.4 (3.7) years. Median time between referral and first appointment with pediatric endocrinologist in gender clinic was 0.3 years (IQR 0.2, 0.4; range 0–2.25). Median (IQR) duration since realizing GD to time of first clinic visit was 4.9 (3.1, 8.2) years (Figure 1A and B). Most individuals reported symptom onset in early adolescence; referrals and clinical visits occurred later, peaking around 14–17 years. Median follow-up after first gender visit with an endocrinologist was 2.4 years (IQR 1.1, 3.3; range 1.1–7.2) (Figure 2). At gender visits when GST, AT, or GAH were considered, all adolescents were pubertal; 298 of 331 (90.0%) AFAB adolescents were reported to be postmenarchal and 33 (10%) premenarchal, with physical examinations indicating that they had at least Tanner 2 breast development. Of the 114 adolescents AMAB, medical records for 103 indicated physical examinations demonstrating testicular volume of at least 4 mL (Tanner 2); for 11 youth, puberty was confirmed with a testosterone level in place of pubertal examination.

Figure 3 shows breakdown of gender identity after first referral. Of the 445 participants, 421 (94.6%, 95% CI 92.1–96.3) continued with their gender identity from initial referral to end of the observation period, and 24 adolescents (5.4%, 95% CI

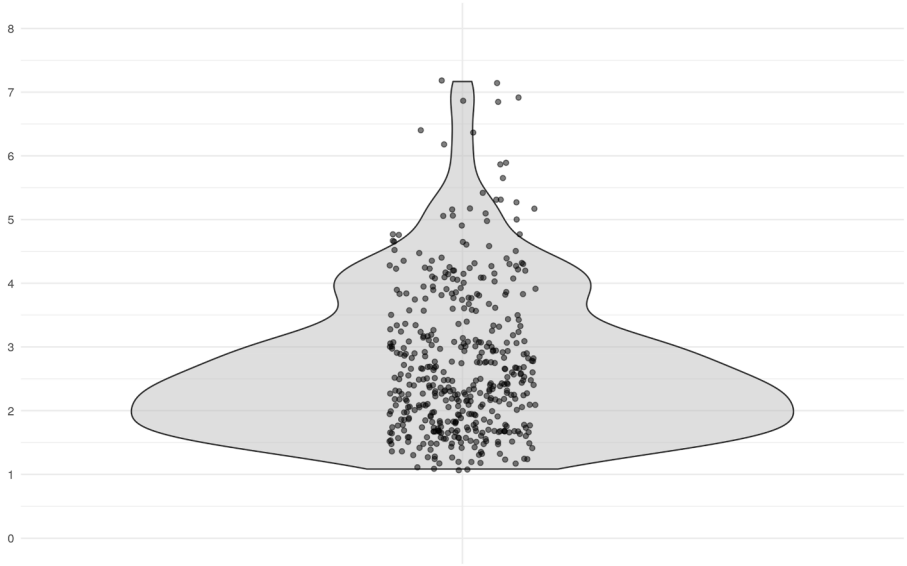

Figure 2. Distribution of follow-up time (years). Duration of follow-up was the difference in age at chart review and age at first visit. Median (IQR) follow-up was 2.4 (1.8, 3.3). Minimum 1.083 to 7.166.

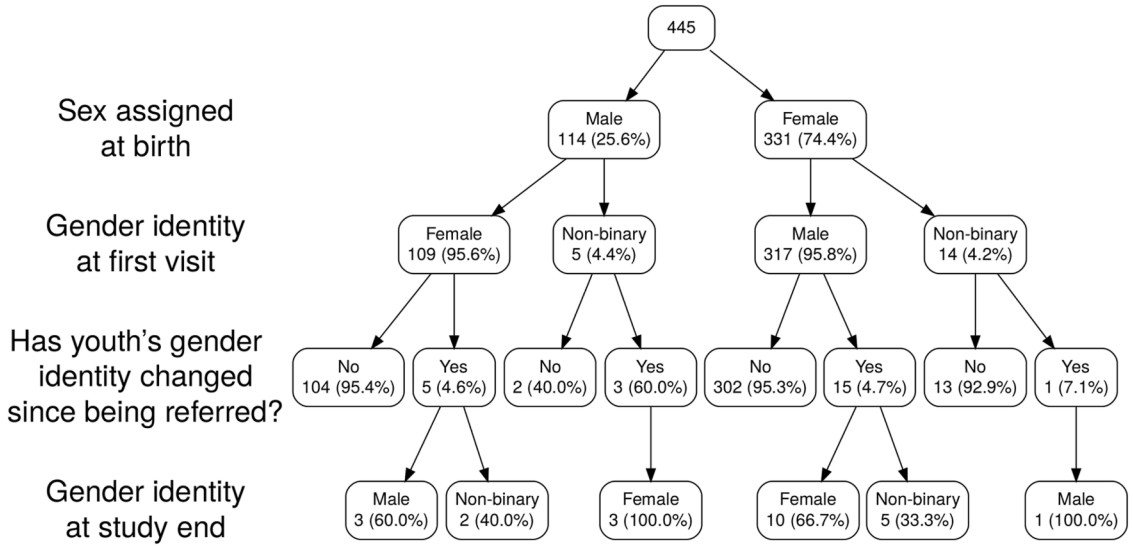

Figure 3. Change in gender identity after referral to pediatric gender clinic.

3.7%–7.9%) changed their gender identity during the follow-up period; among these, eight were AMAB (33.3%) and 16 were AFAB (66.7%), overall reflecting a high level of stability. Of the 445 adolescents, 13 (2.9%) returned to gender identity typically aligned with sex at birth; 10 of 331 (3.0%) AFAB changed from male to female, and three of 114 (2.6%) AMAB changed from female to male gender identity. Among the 19 adolescents (14 AFAB, five AMAB) who identified as non-binary at first visit, four (21.1%) reported a different gender identity later, with none of those adolescents returning to the gender aligned with sex assigned at birth. One AFAB changed from non-binary to male, and three AMAB changed from non-binary to female. In contrast, five adolescents AFAB, initially identifying with male gender identity, changed to non-binary, and two AMAB, initially identifying with female gender identity, changed to non-binary. Overall, 432 of 445 youth (97.1%) continued to identify with a binary or non-binary gender not typical of their birth-assigned sex.

GST or AT was started by 299 adolescents (67.2%) at mean (SD) age of 15.0 (1.8) years. Proportions of those receiving GST or AT differed significantly by sex assigned at birth (Table 1); those AMAB (93 of 114, 81.6%) were more likely ($p < .0001$) to receive GST or AT than those AFAB (206 of 331, 62.2%). GST or AT was discontinued by 35 of 299 youth (11.7%) at mean (SD) age of 16.3 (1.3) years (Table 1). Reasons for GST or AT discontinuation were documented for 17 adolescents. Some adolescents reported more than one of the following reasons for discontinuation of GST or AT: 10 because of a change in gender identity; eight because they were starting or continuing GAH; five identified other avenues to achieve or maintain amenorrhea; four realized

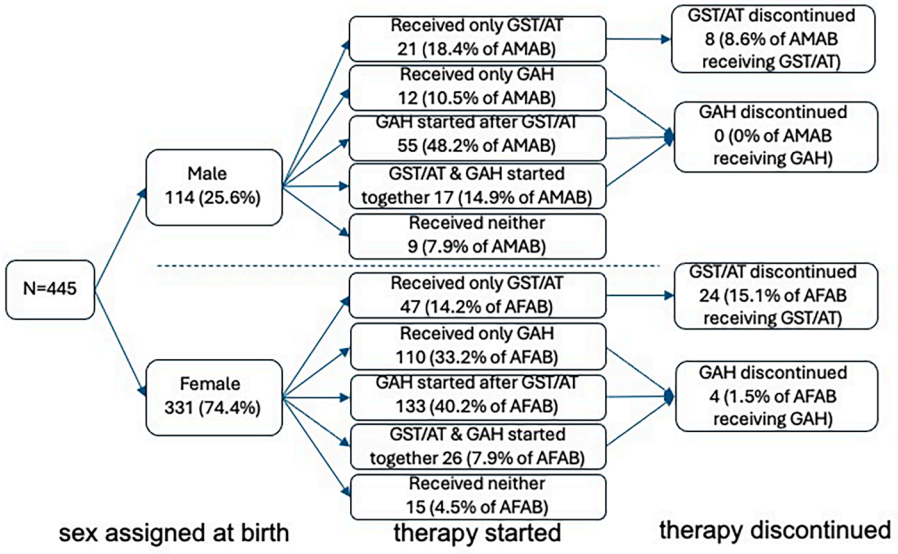
N=445
Male 114 (25.6%)
Female 331 (74.4%)
Received only GST/AT 21 (18.4% of AMAB)
Received only GAH 12 (10.5% of AMAB)
GAH started after GST/AT 55 (48.2% of AMAB)
GST/AT & GAH started together 17 (14.9% of AMAB)
Received neither 9 (7.9% of AMAB)
Received only GST/AT 47 (14.2% of AFAB)
Received only GAH 110 (33.2% of AFAB)
GAH started after GST/AT 133 (40.2% of AFAB)
GST/AT & GAH started together 26 (7.9% of AFAB)
Received neither 15 (4.5% of AFAB)
GST/AT discontinued 8 (8.6% of AMAB receiving GST/AT)
GAH discontinued 0 (0% of AMAB receiving GAH)
GST/AT discontinued 24 (15.1% of AFAB receiving GST/AT)
GAH discontinued 4 (1.5% of AFAB receiving GAH)
sex assigned at birth
therapy started
therapy discontinued

Figure 4. Number of adolescents, starting GST or AT and/or GAH, and discontinuing GST or AT or GAH.

they were gender-fluid; four returned to gender typically aligned with sex assigned at birth; two because menses had stopped with GAH; two due to lack of family support for use of GST or AT; two because of combination of mental health and redefining gender identity as agender; one was concerned about the risk of infertility; one because bone health was important to them; one decided to hold off on transitioning until "their life has stabilized"; and one reported feeling that "1.5 years of GST was long enough."

GAH therapy was started by 353 of 445 adolescents (79.3%) at mean (SD) age of 16.3 (1.3) years; 269 of 331 (81.3%) adolescents AFAB received GAH compared to 84 of 114 (73.7%) AMAB. Of the total starting GAH, 231 (65.4%) received GST or AT and GAH; 188 adolescents started GAH after having previously started GST or AT; 43 started GAH and GST or AT together; 122 started GAH and never started GST or AT; additionally, 68 started GST or AT and never started GAH; and 24 did not start GST, AT, or GAH (Figure 4). Median (IQR) age difference between start of GST or AT and start of GAH was 0.6 years (0.3, 1.0). Only four of the 353 (1.1%) adolescents, all AFAB, stopped GAH; one had also received GST or AT. Reasons reported for GAH discontinuation are: one developed extreme depression and attributed this to GAH; one had anxiety about effects on fertility and risk of scalp hair loss; one had dissatisfaction with the physical changes experienced so far; and one due to reidentification as non-binary.

Discussion

This retrospective chart review of 445 adolescents diagnosed with GD, using the DSM-5 criteria [18], referred to four Canadian academic pediatric endocrinology gender clinics, found that over follow-up period of 0.25–7.2 years, gender identity was stable in most (421 of 445, 94.6%). This was a carefully evaluated cohort following the guidelines set out by the Endocrine Society [4] and WPATH SOC 7 [24]. Although 24 of 445 adolescents (5.4%) changed their gender identity, only 13 (2.9%) reidentified with their birth assigned sex. In contrast, 21.0% of the 19 adolescents who identified as non-binary at their first visit changed their gender identity, with none of those adolescents returning to the gender typically aligned with their birth assigned sex. The small proportion (2.9%) of adolescents reidentifying with birth-assigned gender in our study aligns with the 2024 findings of a reidentification rate of 5.3% in a pediatric clinical sample of 548 youth [12].

GST or AT was started by 67.2% of the 445 adolescents in our study. Because 90.0% of the adolescents AFAB in our study were postmenarchal, these adolescents were less likely to desire GST in the form of an injectable GnRH analog (such as leuprolide acetate), compared to other means for menstrual suppression such as AT. A total of 68 (15%) started GST or AT only, while 24 (5%) never received GST, AT, or GAH. Among those who started GST or AT, they were discontinued by 11.7%. Although this is higher than the 8% discontinuation rate reported by McCallion et al. in their retrospective review of 91 youth, referred from 2011 to 2019, their study commented only on discontinuation of GnRH agonist (GnRHa) therapy [28]. In contrast, GST in our study included GnRHa therapy or medroxyprogesterone acetate. Adjunctive therapies were used instead of GST for menstrual and androgen suppression such as continuous oral contraceptives or spironolactone. Of the 17, in whom a reason for discontinuation of GST or AT was documented in the chart, in 10 youth, it was because of a change in gender identity, but in only four (1.3%), it was because of realignment of gender identity with birth-assigned gender. Similarly, trends in treatment trajectories over the first 20 years of the Dutch Protocol revealed that, of 882 who started GnRHa therapy, 1.6% discontinued it prior to starting GAH, while abatement of GD was the reason in 1% [29]. One goal of GnRHa therapy is to provide youth time to explore their gender identity further while pausing the physical changes that may intensify GD. Consequently, it is expected that some will discontinue GST or AT and not progress to GAH. Similarly, AT for menstrual suppression and androgen blockade may serve a comparable role, and for some, this may be sufficient to achieve their transition goals. For others, the decision to pursue and continue GST, AT, or GAH may evolve over time and ultimately no longer align with their gender journey. These data further highlight the importance of individualizing hormone therapies for each youth. Olson et al. found that support for social transition by a parent/guardian was associated with persistence (stability) of gender identity [30].

GAH was started by 79.3% in our study, with only four of 353 adolescents choosing to stop GAH, similarly reported by earlier studies [13,28,31]. The Dutch cohort study found that 98% of 720 adolescents who had started GAH in adolescence continued to use GAH at a median age of 20 years [31]. Similarly, in 2022, Butler found that 5.3% of their UK youth cohort stopped either GnRHa or GAH [13]. An online survey of 3,937 adults and adolescents (with 75.5% from Canada and 24.5% from the United States) at the mean age of 21.1 (SD 4.1) years found that 16.8% of those who had started gender-affirming medical care had discontinued treatment at least once for reasons including being older, health, having non-binary or "other" gender identity, change in gender identity, treatment side effects, living in the United States, or cost [1]. Of those who discontinued gender-affirming medical treatment, 80.2% reported that they currently identify as transgender or gender-diverse [1].

Strengths

In our study, each adolescent had a comprehensive assessment aligning with the WPATH SOC version 7 [24] or 8 [3] and Endocrine Society Clinical Practice guidelines [4], completed by trained medical or mental health professionals, prior to starting GST or AT and/or GAH. This robust assessment process strengthens confidence in the appropriateness of treatment decisions and aligns with the best practices in gender-affirming care. Additionally, the inclusion of data from four academic pediatric gender clinics enhances the generalizability of our findings across different clinical settings. The study also benefits from a relatively large sample size, improving the statistical power of our analyses, as does the fact that none of the adolescents were lost to follow-up. The reported high stability of gender identity and low rates of discontinuation of GAH further support the existing literature indicating that most TNB youth continue with treatment after GAH initiation.

Limitations

The retrospective study design introduces selection bias, as only individuals who accessed gender-affirming care at participating clinics were included. This excludes youth who sought care elsewhere, did not seek medical intervention, and/or lacked parental support, potentially affecting generalizability.

Information bias may be present due to reliance on electronic medical records, which might not consistently capture all relevant patient data, such as social and psychological factors influencing treatment decisions. In addition, gender identity relied on the adolescent/parent report, which is subject to recall bias. Of the 445 adolescents in this study, 120 adolescents provided school grade (rather than an age) when they developed GD, requiring us to impute an age [25]. As in other studies, we had a higher proportion of adolescents AFAB, who identified as male or non-binary, compared to those AMAB. This may relate, in part, to the transphobia and greater discrimination faced by transfeminine adolescents and the higher barriers for transfeminine adolescents to come out to their parents and gain access to care [32,33]. This is further supported by the observations that, while other clinical samples have also described an unequal ratio of AFAB to AMAB youth, this difference has not been found in population-based samples [29]. In addition, puberty begins earlier for those AFAB, leading to onset of GD at earlier ages than for those AMAB [23]. Future research should explore longitudinal follow-up strategies to better capture long-term outcomes in transgender and gender-diverse youth.

Conclusion

This multicenter Canadian study found that the majority (97.1%) of adolescents referred to academic pediatric gender clinics, for gender-affirming care, continued to identify as transgender or non-binary over a median follow-up of 2.4 years. Only (2.9%) reidentified with gender aligned with their sex assigned at birth. Gender identity reported at first visit was more fluid in adolescents who initially identified as non-binary, although none reverted to a binary identity aligned with birth sex. Most (79.3%) adolescents initiated GAH, with GAH discontinuation rare (1.1%) and no adolescents discontinued GST or AT due to reidentification with gender identity aligned with sex assigned at birth. Of the 67.2% of adolescents who started GST or AT, 11.7% later stopped for a variety of reasons, including that they were starting (or had started) GAH. These findings support that within a clinical context involving comprehensive psychosocial assessment and support, gender identity among adolescents is highly stable, and rates of reidentification with birth assigned gender and cessation of GAH are low.

These results underscore the importance of ongoing discussions with youth and their families about potential for gender identity to evolve, even after thorough assessment. As a component of the comprehensive assessment and prior to initiating GAH, clinicians must provide clear information on all management options, including the benefits and risks of both initiating or delaying GST or AT, and GAH, to support informed decision-making. Additionally, it is essential that a supportive team of medical professionals remains available to help the youth and family navigate ongoing needs, even if the youth's identity changes over time and a decision is made to discontinue GAH. These findings may offer reassurance to those concerned that adolescents are too young to understand their gender identity or make decisions about medical transition.

Acknowledgments

We thank Dominique Trudel, Nikita Anderson, and Christopher MacDonald for their assistance with the chart review, Dominique Trudel and Nikita Anderson for entering the data into REDCap, and Raj Kaur for her assistance with REDCap data calculations. We appreciate the analysis that Greta Bauer completed for the smaller cohort described in the WPATH poster presented in September 2022. This study was presented in part as a poster presentation at WPATH Scientific Symposium, Montreal, Quebec, Canada, September 2022.

Funding Sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Supplementary Data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jadohealth.2026.03.016.

References

[1] MacKinnon KR, Jeyabalan T, Strang JF, et al. Discontinuation of gender-affirming medical treatments: Prevalence and associated features in a nonprobabilistic sample of transgender and gender-diverse adolescents and young adults in Canada and the United States. J Adolesc Health 2024;75:569–77.
[2] Respaut R, Tehune C. Number of transgender children seeking treatment surges in US. Reuters. 2022. Available at: https://www.reuters/com/investigates/special-report/usa-transyouth-data. Accessed January 31, 2025.
[3] Coleman E, Radix AE, Bouman WP, et al. Standards of care for the health of transgender and gender diverse people, version 8. Int J Transgender Health 2022;23:S1–529.
[4] Hembree WC, Cohen-Kettenis PT, Gooren L, et al. Endocrine treatment of gender dysphoric/gender-incongruent persons: Endocrine society clinical practice guidelines. JCEM 2017;102:3869–903.
[5] German Society for Child and Adolescent Psychiatry. Psychosomatics and Psychotherapy (DGKJP, 2025): 52k guideline gender incongruence and gender dysphoria in childhood and adolescence: Diagnosis and treatment. AWMF Register No. 028-014. version 1.0. 2025. Available at: https://register/awmf.org/de/leitlinien/detail/028-014. Accessed October 27, 2025.
[6] Chen D, Berona J, Yee-Ming C, et al. Psychosocial functioning in transgender youth after 2 years of hormones. NEJM 2023;388:240–50.
[7] Green AE, DeChants JP, Price MN, Davis CK. Association of gender-affirming hormone therapy with depression, thoughts of suicide, and attempted suicide among transgender and nonbinary youth. J Adolesc Health 2021;70:643–9.
[8] Kaltiala R, Helminen M, Holttinen T, Tuisku K. Discontinuing hormonal gender reassignment: A nationwide register study. BMC Psychiatry 2024;24:566.
[9] Roberts CM, Klein DA, Adirim TA, et al. Continuation of gender-affirming hormones among transgender adolescent and adults. J Clin Endocrinol Metab 2022;107:E3937–43.
[10] Olson KR, Raber GF, Gallagher NM. Levels of satisfaction and regret with gender-affirming medical care in adolescence. JAMA Pediatr 2024;178:1354–61.
[11] Kidd KM, Sequeira GM. Misinformation related to discontinuation and regret among adolescents receiving gender-affirming care. J Adolesc Health 2024;75:698–9.
[12] Cavve BS, Bickendorf X, Ball J, et al. Reidentification with birth-registered sex in a Western Australian pediatric gender clinic cohort. JAMA Pediatr 2024;1:178:446–53.
[13] Butler G, Adu-Gyamfi K, Clarkson K, et al. Discharge outcome analysis of 1089 transgender young people referred to paediatric endocrine clinics in England 2008-2021. Arch Dis Child 2022;107:1018–22.
[14] Boskey ER, Scheffey KL, Pilcher S, et al. A retrospective cohort study of transgender adolescents' gender-affirming hormone discontinuation. J Adolesc Health 2025;76:584–91.
[15] Real AG, Russell ST. Why do adolescents and young adults discontinue gender-affirming treatments? There is no simple answer. J Adolesc Health 2024;75:526–7.
[16] de Vries ALC, Hannema SE. Growing evidence and remaining questions in adolescent transgender care. NEJM 2023;388:275–7.
[17] van der Miesen AIR, Rap S, Fischbach AL, et al. "I bet being trans in The Netherlands is like living in the future": Could the Netherlands serve as an imperfect gold standard comparator for transgender youth research in the United States? Int J Transgender Health 2025:1–17.

[18] Santos M, Zempsky WT, Shmerling J. Moving beyond statements to protect transgender youth. JAMA 2024;332:529–30.
[19] American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th edition. Arlington, VA: American Psychiatric Association; 2013.
[20] Taylor J, Hall R, Langton T, et al. Characteristic of children and adolescents referred to specialist gender services: A systematic review. Arch Dis Child 2024;109:S3–11.
[21] Real AG, Russell ST. Outness, acceptance, and victimization: A longitudinal study of depressive symptoms and suicidality of lesbian, gay, and bisexual and transgender and gender diverse youth. J Adolesc Health 2024;76:29–36.
[22] Whittle K, Moore E, Stallard P. Self-harm, suicidal ideation, depression, and peer relationships in transgender and gender diverse adolescents accessing specialist mental health services. Child Adolesc Ment Health 2024;29:363–70.
[23] Lawson ML, Gotovac S, Couch B, et al. Pathways to care for adolescents attending a first hormone appointment at Canadian gender affirming medical clinics: A cross-sectional analysis from the Trans Youth CAN! study. J Adolesc Health 2024;74:140–7.
[24] Coleman E, Bockting W, Botzer M, et al. Standards of care for the health of transexual, transgender, and gender-nonconforming people, version 7. Int J Transgenderism 2012;13:165–232.
[25] Canadian education: grade levels. Available at: https://www.ourkids.net/school/canada-grade-levels. Accessed February 4, 2025.
[26] Wilson, Edwin B. Probable inference, the law of succession, and statistical inference. J Am Stat Assoc 1927;22:209–12.
[27] R Core Team. A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing; 2024.
[28] McCallion S, Smith S, Kyle H, et al. An appraisal of current service delivery and future models of care for young people with gender dysphoria. Eur J Pediatr 2021;180:2969–76.
[29] van der Loos MATC, Klink DT, Hannema SE, et al. Children and adolescents in the Amsterdam Cohort of Gender Dysphoria: Trends in the diagnostic and treatment trajectories during the first 20 years of the Dutch Protocol. J Sex Med 2023;20:398–409.
[30] Olson KR, Durwood L, Horton R, et al. Gender identity 5 years after social transition. Pediatrics 2022;150:e2021056082.
[31] van der Loos MATC, Hannema SE, Klink DT, et al. Continuation of gender-affirming hormones in transgender people starting puberty suppression in adolescence: A cohort study in the Netherlands. Lancet Child Adolesc Health 2022;6:869–75.
[32] Pullen Sansfacon A, Faddoul M, Lee IOJ. Soutien et non soutien parental des jeunes trans: vers une compréhension nuancée des formes de soutien et des attentes des jeunes trans [Parental support and non-support of trans youth: towards a nuanced understanding of forms of support and trans youth's expectations]. Rev Int Enfances Fam Gener 2020;36:1–19.
[33] Grossman AH, D'Augelli AR, Salter NP, Hubbard SM. Comparing gender expression, gender nonconformity, and parents' responses of female-to-male and male-to-female transgender youth. J LGBT Issues Coun 2006;1:41–59.